

Phase 1 Biological Impairment TMDL For Parmicha Creek North Independent Basin Alcorn County Mississippi



Prepared By

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FOREWORD

The report contains one or more Total Maximum Daily Loads (TMDLs) for waterbody segments found on Mississippi's 1996 Section 303(d) List of Impaired Waterbodies. Because of the accelerated schedule required by the consent decree, many of these TMDLs have been prepared out of sequence with the State's rotating basin approach. The segments addressed are comprised of monitored segments that have data indicating impairment. The implementation of the TMDLs contained herein will be prioritized within Mississippi's rotating basin approach.

The amount and quality of the data on which this report is based are limited. As additional information becomes available, the TMDLs will be updated. Such additional information may include water quality and quantity data, changes in pollutant loadings, or changes in landuse within the watershed. In some cases, additional water quality data may indicate that no impairment exists.

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MONITORED SEGMENT IDENTIFICATION

Name:	Parmicha Creek
Waterbody ID:	MS203TM2
Location:	Near Biggersville: Just East of Hightown to the confluence with the Tuscumbia River Canal
County:	Alcorn County, Mississippi
USGS HUC Code:	08010207
NRCS Watershed:	203
Length:	15 miles
Use Impairment:	Aquatic Life Support
Cause Noted:	Biological Impairment
Priority Rank:	135
NPDES Permits:	There is one NPDES Permit issued for a facility that discharges into this waterbody.
Pollutant Standard:	The waterbody shall meet the conditions for waterbodies designated for use as Aquatic Life Support described in <i>State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters (MDEQ, 1995)</i> .
Phase 1 TMDL Report:	A pollutant specific TMDL for Parmicha Creek will be developed as a Phase 2 TMDL if the waterbody is determined to be biologically impaired and a particular pollutant is determined to be the cause of impairment. The Phase 2 TMDL, if developed, will include a waste load allocation, a load allocation, and a margin of safety for the particular pollutant identified by monitoring.
Wasteload Allocation	5.63 pounds per day CBOD ₅
Load Allocation	0.34 pounds per day CBOD ₅
TMDL for NPDES point source	5.97 pounds per day CBOD ₅

EXECUTIVE SUMMARY

Parmicha Creek has been placed on the Mississippi 1998 Section 303(d) List of Waterbodies as an impaired waterbody segment. The impairment was detected based on a screening-level biological monitoring event. Biological impairment indicates impairment for waterbodies in which at least one biological assemblage (fish, macroinvertebrates, or algae) indicates less than full support with moderate modification of the biological community noted. The initial screening-level monitoring is not adequate to make an assessment call of not supporting for this stream.

This TMDL Report is a Phase 1 TMDL. The TMDL Report is being proposed as a phased TMDL Report because there are not enough data currently available to determine the specific pollutant that may be causing biological impairment. In addition, the original biological impairment assessment was analyzed based on screening-level macroinvertebrate assessments and limited physical/chemical data. More data are needed to make an accurate assessment.

MDEQ recently conducted a detailed rapid biological assessment (RBA) on this waterbody in the 2001 IBI Development Project. MDEQ's contractor is currently in the process of analyzing the results of this field study. The RBA performed on Parmicha Creek was part of a statewide effort to develop an index of biological integrity (IBI). Once developed, this IBI will enable MDEQ to interpret biological assessment results in a more accurate and appropriate manner for the state of Mississippi. The assessment of the RBA conducted on Parmicha Creek will be available in January of 2002. At that time, a use-support decision for Parmicha Creek will be made.

If Parmicha Creek is determined to be fully supporting of its designated use, the waterbody will be removed from the next 303(d) list and no further action will be taken. However, if the biological community in Parmicha Creek is found to be impaired, and the waterbody is determined to not support its designated use, further study will be conducted. Further study would target data to determine a specific cause of impairment for Parmicha Creek. If a specific cause of impairment is determined, a Phase 2 TMDL will be developed in 2002 for that pollutant.

MDEQ completed a DO sag model for the one NPDES Permitted source in the watershed to ensure the point source was not impairing the waterbody. The TMDL for CBOD₅ is included in this TMDL Report to provide documentation that the stream does indeed have assimilative capacity for the NPDES Permit currently located in the watershed.

Parmicha Creek flows in a northeastern direction from its headwaters to the confluence with the Tuscumbia River. The 15-mile long impaired creek is in Alcorn County near Biggersville from just east of Hightown to the mouth of the Tuscumbia River, Figure 1.

Phase 1 Biological Impairment TMDL Parmicha Creek, Mississippi

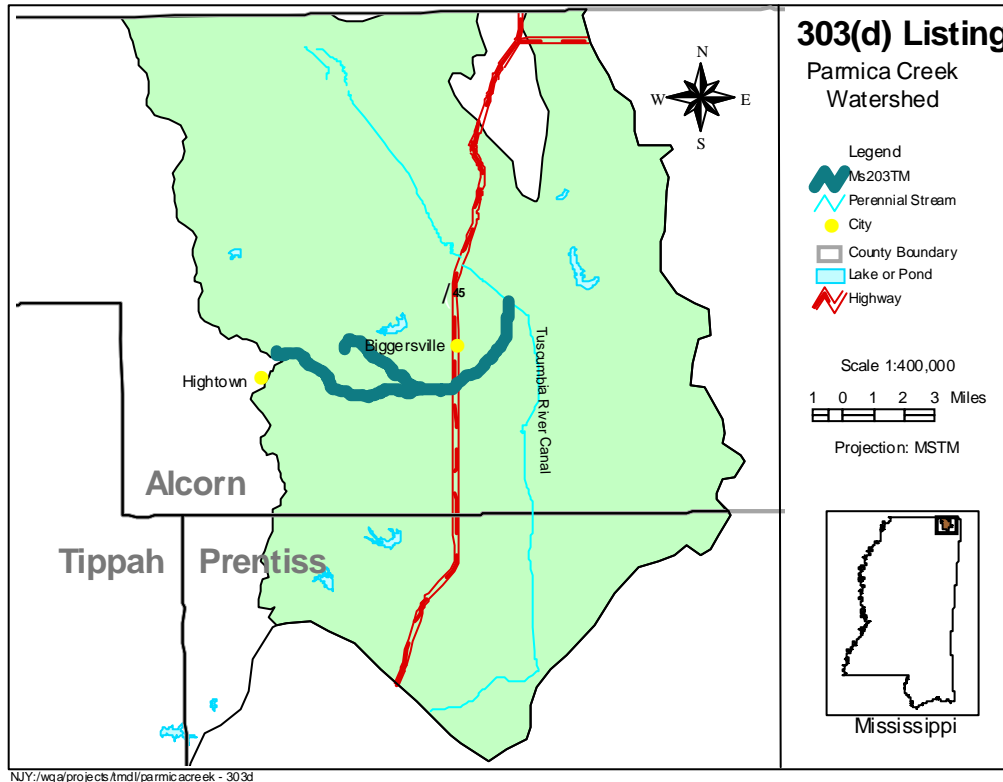


Figure 1: Location of 303(d) Listed Segment

1.0 INTRODUCTION

1.1 Background

The identification of waterbodies not meeting their designated use and the development of total maximum daily loads (TMDLs) for those waterbodies are required by Section 303(d) of the Clean Water Act and the Environmental Protection Agency's (EPA) Water Quality Planning and Management Regulations (40 CFR part 130). The TMDL process is designed to restore and maintain the quality of those impaired waterbodies through the establishment of pollutant specific allowable loads. The TMDL process can be used to establish water quality based controls to reduce pollution from both point and nonpoint sources, and restore and maintain the quality of water resources. The Mississippi Department of Environmental Quality (MDEQ) has identified Parmicha Creek as being biologically impaired for a length of 15 miles as reported in the Mississippi 1998 Section 303(d) List of Waterbodies. This assessment was made based on information collected during a screening-level biological assessment in 1993. This data is not adequate to support an assessment call. MDEQ recently completed another biological assessment based on the assessment criteria established for development of the Mississippi Index of Biological Integrity that is currently under development.

Parmicha Creek is in the North Independent River Basin Hydrologic Unit Code (HUC) 08010207 in northeastern Mississippi, Photo 1. The drainage area is approximately 9,639 acres; and lies entirely within Alcorn County. The watershed is rural in nature and includes the town of Biggersville. The landuse within the Parmicha Creek watershed is shown in Figure 2. The landuse information is based on data collected by the State of Mississippi's Automated Information System (MARIS, 1997). This data set is based on Landsat Thematic Mapper digital images taken between 1992 and 1993.

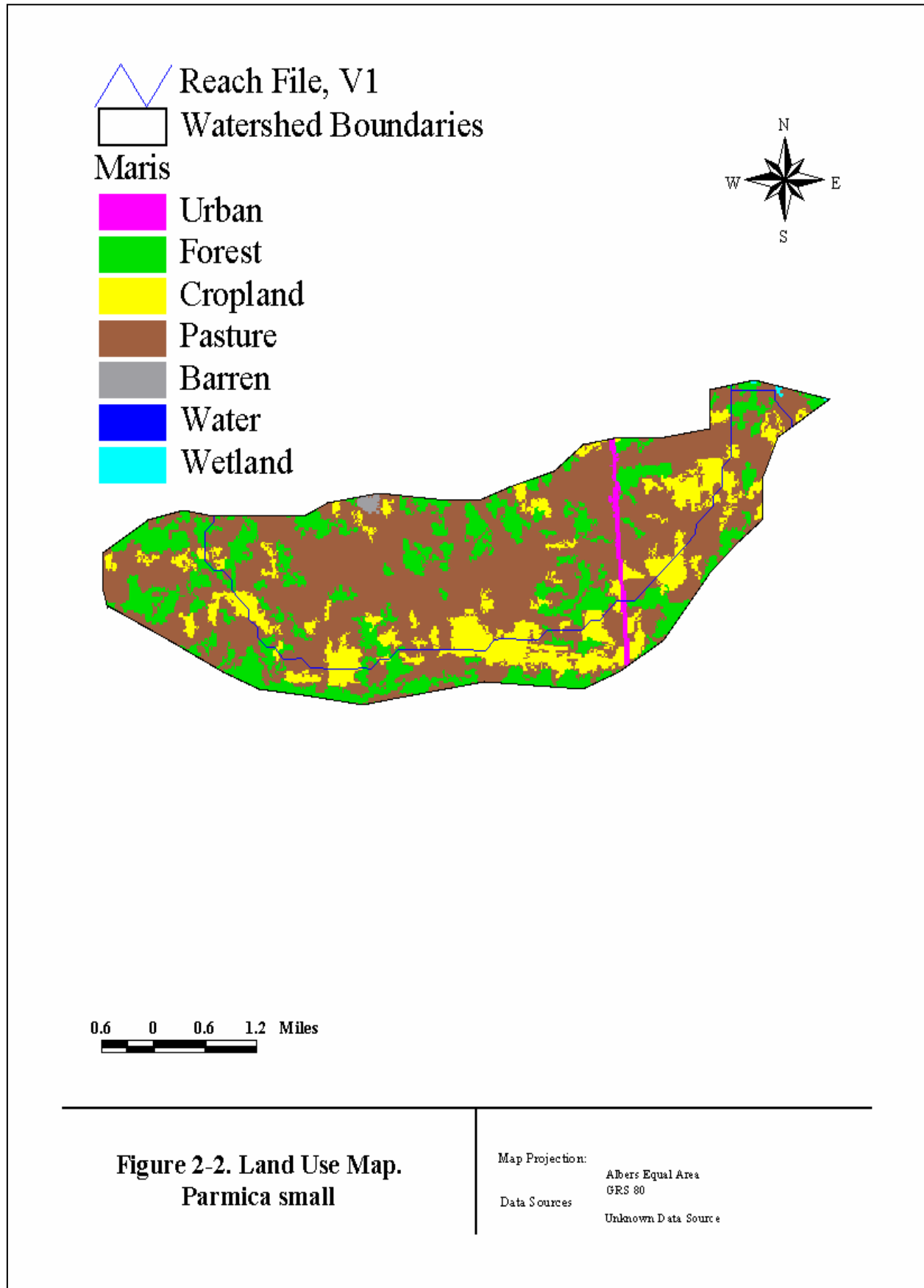


Photo 1: Parmicha Creek near Biggersville

1.2 Applicable Waterbody Segment Use

Designated beneficial uses and water quality standards are established by the *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters* regulations. The designated use for Parmicha Creek as defined by the regulations is Fish and Wildlife Support. Waters designated for use as Fish and Wildlife support must also be suitable for secondary contact recreation, which is defined as incidental contact with the water including wading and occasional swimming.

Figure 2: Landuse Distribution



**Figure 2-2. Land Use Map.
Parmicha small**

2.0 WATERBODY ASSESSMENT

This Phase 1 TMDL Report includes the identification of all known potential pollutant sources in the Parmicha Creek watershed and an analysis of available water quality data. The potential point and nonpoint pollutant sources were characterized by the best available information, monitoring data, and literature values. This section documents the available information for Parmicha Creek.

2.1 Assessment of Point Sources

Organic enrichment is measured in terms of total ultimate biochemical oxygen demand (TBOD_u). TBOD_u is the oxygen consumed by microorganisms while stabilizing or degrading carbonaceous and nitrogenous compounds under aerobic conditions over an extended time period. The carbonaceous compounds are referred to as CBOD_u, and the nitrogenous compounds are referred to as NBOD_u. TBOD_u is equal to the sum of NBOD_u and CBOD_u, Equation 1.

$$\text{TBOD}_u = \text{CBOD}_u + \text{NBOD}_u \quad (\text{Equation 1})$$

Low DO typically occurs during seasonal low-flow periods of late summer and early fall. Elevated oxygen demand is of primary concern during dry periods because the effects of low-flow, minimum dilution, and high temperatures combine to produce the worst case potential effect on water quality (USEPA 1997). The low-flow, high-temperature period is referred to as the critical condition. The maximum impact of a TBOD_u load is generally not at the location of the discharge, but at some distance downstream. The point of maximum impact is the point at which the maximum DO deficit occurs. The DO deficit is defined as the difference between the DO concentration at 100 % saturation and the actual DO. This TMDL will require that the TMDL endpoint, a daily DO average of not less than 5.0 mg/L, will be maintained at the point of maximum DO deficit during critical conditions.

The literature value of the CBOD_u to CBOD₅ ratio for well-treated municipal/domestic wastewater is 2.30. This value is given in *Empirical Stream Model Assumptions for Conventional Pollutants and Conventional Water Quality Models* (MDEQ 1995). This value is recommended for use when actual field data is not available. This is shown in equation 2.

$$\text{CBOD}_u = \text{CBOD}_5 * 2.30 \quad (\text{Equation 2})$$

The calculation for determining the value of NBOD_u is shown in equation 3.

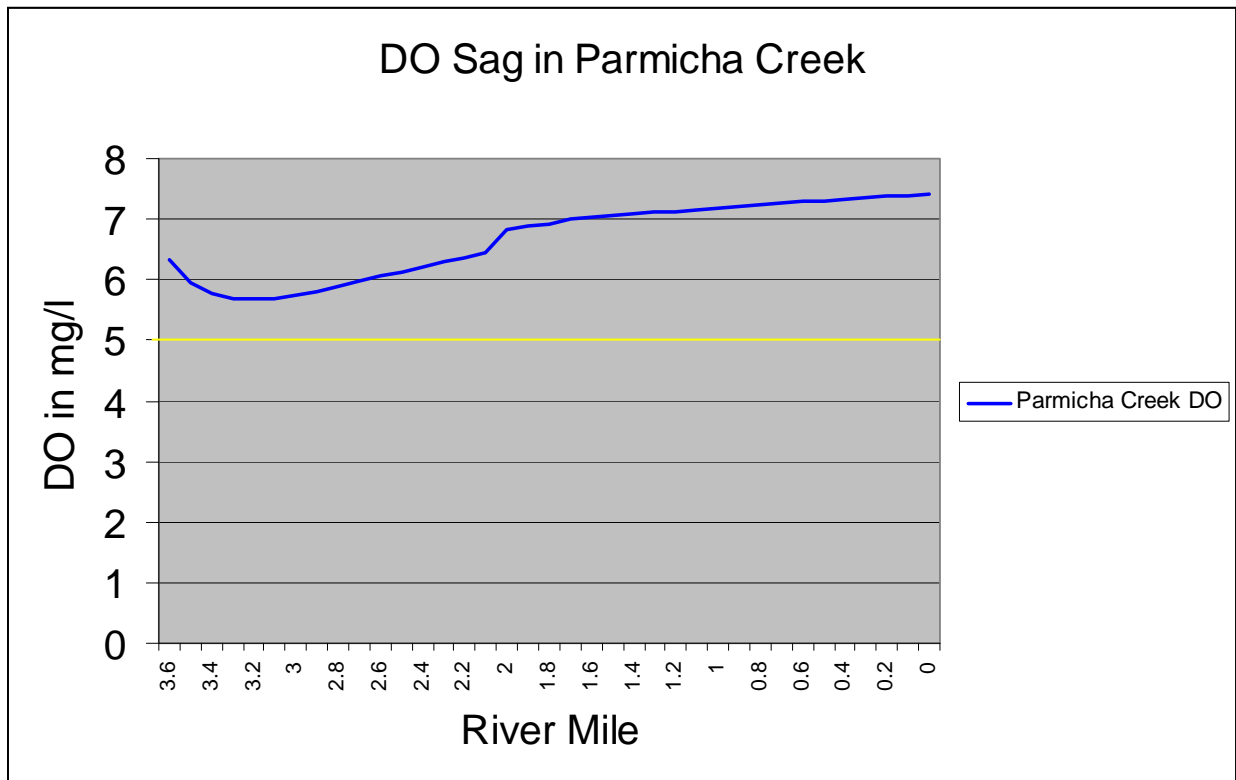
$$\text{NBOD}_u = \text{NH}_3 * 4.56 \quad (\text{Equation 3})$$

There is one NPDES permitted discharger in the Parmicha Creek Watershed, the Biggersville School, NPDES Permit Number MS0030589. The permitted discharge of this facility is 0.015 MGD. The NPDES permit for this facility also includes discharge limits of a daily average of 30 mg/l BOD₅, 30 mg/l total suspended solids, and 200 counts/100 ml of fecal coliform bacteria. Examination of discharge monitoring reports (DMRs) for the facility indicated that the facility is in compliance with its NPDES permit. Because this facility has a small flow and is in compliance with its permit, it is not suspected to be a cause of impairment in Parmicha Creek.

To document this assumption, MDEQ completed a DO Sag model for this NPDES Permitted source. The results of the model are shown in the graph below. The dissolved oxygen in Parmicha Creek and in the small tributary remains above 5.0 mg/l according to the model. The TMDL calculations for this report were based on the results of this model. The LA portion of the TMDL was based on the flow of the headwater and distributed inflow of 0.02 cfs with a lbs/day of CBOD₅ set equal to 0.34 lbs/day. The WLA was based on the flow from the treatment facility of 0.023 cfs with a concentration of 30mg/l CBOD₅. This calculates to a WLA of 5.63 lbs/day. These values were included in the model that produced this graph. These values were added together to establish the TMDL. The margin of safety is implicit.

$$\text{TMDL} = 0.34 \text{ LA} + 5.63 \text{ WLA} = 5.97 \text{ lbs/day CBOD}_5$$

(Equation 4)



The model was set up with the point source entering in the headwaters of a small tributary to Parmicha Creek at the Biggersville School. The DO sag actually occurred within the small tributary. The tributary entered the main stream of Parmicha Creek at river mile 2.1 in the

model. The model indicates there is assimilative capacity in the stream for additional CBOD₅. This indicates that CBOD₅ is not an impairment of biological impairment in the stream.

Impairment of the biological community of Parmicha Creek, which is potentially due to the presence of an undetermined pollutant, has been identified. Thus, this Phase 1 TMDL, will place restrictions on NPDES permitting activities in Parmicha Creek and tributaries of Parmicha Creek such that no increase in the current loadings specified in existing permits will be allowed. Furthermore, no new NPDES permits will be issued for dischargers into Parmicha Creek until a pollutant has been identified in the Phase 2 TMDL or the cause has been delisted based on the most recent biological assessment.

2.2 Assessment of Nonpoint Sources

There are many potential nonpoint sources of pollutants in a waterbody, such as failing septic systems, wildlife, agricultural management practices, and urban development. Potential nonpoint sources were analyzed by using data available from EPA's Watershed Characterization System (WCS). WCS provides detailed information about a watershed including land use, population, estimated numbers of livestock, livestock management practices, and soil and climate data.

The 9,639-acre drainage area of Parmicha Creek contains many different landuse types, including urban, forest, cropland, pasture, water, and wetlands, Table 2. The landuse information is based on data collected by the State of Mississippi's Automated Information System. This data set is based on Landsat Thematic Mapper digital images taken between 1992 and 1993. Pasture and forest are the dominant landuses within this watershed. Tables 2-2 through 2-8 give additional information on the Parmicha Creek Watershed and Alcorn County that was obtained from WCS.

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Table 2-1: Landuse Distribution, (MARIS, 1997)

Landuse	Acres	Percent
Deciduous Forest	2993	31.0
Evergreen Forest	717	7.4
Mixed Forest	709	7.3
High Intensity Commercial/Industrial/Transportation	14	0.2
Low Intensity Residential	3	0.1
Open Water	100	1.0
Pasture/Hay	2920	30.3
Row Crops	2174	22.6
Woody Wetlands	9	0.1
Total	9639	100.0

Table 2-2: County and Watershed Population Estimates, Parmicha Creek Watershed

Total County Population, 1990	Estimated County Population, 1997	Portion of Watershed (%)	Estimated Population in Watershed, 1990	Estimated Population in Watershed, 1997	Estimated Percent Change
31,722	32,818	3.68	1,169	1,209	3.4

Table 2-3: Soil Characteristics by STATSGO Soil Map Units

STATSGO Map Unit ID	MS122	MS123	MS124	MS125
Water Table Depth (% < 4 ft.)	30.00	100.00	100.00	73.00
Percent Poor Drainage (%)	3.00	49.00	100.00	9.00
Percent Hydric (%)	0.00	20.00	100.00	0.00
Hydrologic Group	C	C	C	C
Available Water Capacity (in/in)	0.14	0.21	0.21	0.17
Permeability (in/hr)	2.00	1.30	1.30	2.41
Bulk Density (g/cc)	1.47	1.41	1.47	1.43
Soil pH	5.03	5.06	5.00	5.03
Percent Clay (%)	11.19	19.25	19.03	10.51
Percent Silt and Clay (%)	49.53	87.63	83.70	66.77
Estimate Soil Texture	Loam	Silty Loam	Silty Loam	Silty Loam
Percent Organic Matter (%)	1.80	1.48	2.00	1.76
Soil Erodibility	0.30	0.46	0.43	0.38
Soil Erodibility Range	0.28 - 0.49	0.43 - 0.49	0.43 - 0.43	0.28 - 0.49

Table 2-4: Average Monthly Precipitation and Temperature, from Station 221962: CORINTH CITY

Parameter	Min. Precip	Max. Precip	Mean. Precip	Min. Temp	Max. Temp	Mean Temp
Jan	4.39	6.47	5.23	31.72	50.02	40.9
Feb	1.87	7.62	3.94	34.42	55.36	44.95
Mar	3.41	8.93	6.12	41.04	64.59	52.86
Apr	3.07	5.58	4.53	47.76	73.22	60.51
May	2.79	7.36	5.4	57.4	80.44	68.93
Jun	1.76	11.04	5.4	66.16	87.53	76.87
Jul	2.03	7.65	5.14	70.29	92.28	81.28
Aug	3.47	6.14	4.32	68.19	91.19	79.73
Sep	2.43	8.54	5.13	59.09	84.48	71.81
Oct	2.71	5.76	3.95	48.33	74.1	61.22
Nov	1.86	6.56	4.36	38	61.14	49.62
Dec	4.34	9.02	6.27	35.49	54.14	44.82
Annual	48.71	71.28	59.81	49.82	72.37	61.12

Table 2-5: Summary of Crop Distribution by County

County	Crop Land (Acres)	Corn for Grain or Seed (Percent)	Hay-all (Percent)	Soybeans or Beans (Percent)
ALCORN	25073	27	34	39

Table 2-6: Summary of Livestock Count Estimates by County

County	Beef Cow	Cattle	Chickens	Hogs	Milk Cow
ALCORN	5091	10332	670	1253	48

Table 2-7. Summary of Livestock Count Estimates by Watershed

Watershed	Beef Cow	Cattle	Chickens	Hogs	Milk Cow
Parmicha Creek	309	626	1	76	3

Table 2-8. Estimated Fertilizer Use (tons/mi²) by Watershed

Watershed	Nitrogen	Phosphate	Potash
Parmicha Creek	3.9	0.88	1.42

2.3 Discussion of Instream Water Quality Data

The State's 1998 Section 305(b) Water Quality Assessment Report was reviewed to assess water quality conditions and data available for the watershed. Limited water quality data are available for the monitored segment of Parmicha Creek. According to the report, Parmicha Creek is partially supporting for the use of aquatic life support. These conclusions were based on instantaneous water chemistry data and screening-level biological assessment conducted at NZ1707029278.70 in 1993. The score from this monitoring, which was used for listing on the Section 303(d) list is shown in Table 2.2. The screening level biological assessment determined that the overall biological condition was moderately impaired. This monitoring station is part of MDEQ's basin assessment monitoring program. This station is located near Biggersville at County Road 408. The location of the monitoring station is shown in Figure 3. Two additional water quality samples were collected at this station in 1998, Table 2.1.

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Table 2.9 Instantaneous Water Quality Data for Parmicha Creek, Station NZ1707029278.70

	01/27/98	07/21/98
Water Temperature (°C)	Not given	9.50
pH	Not given	7.25
Dissolved Oxygen (mg/l)	Not given	15.02
Conductivity (uhmos/cm)	Not given	88.0
COD (mg/l)	19.0	30.0
TOC (mg/l)	Not given	5.0
Total Phosphorous (mg/l)	0.03	0.06
Total Kjeldhal Nitrogen (mg/l)	0.14	0.63
Ammonia (mg/l)	0.10	0.32
Nitrite + Nitrate (mg/l)	0.02	0.12
Turbidity (NTU)	8.0	16.0

Table 2.10 Biological Monitoring Event Score

Biological Monitoring Event Scores	
Biological Index Score	6.41
Index narrative rating	Fairly Poor
Habitat narrative rating	Fair
Overall Biological condition	Moderately Impaired

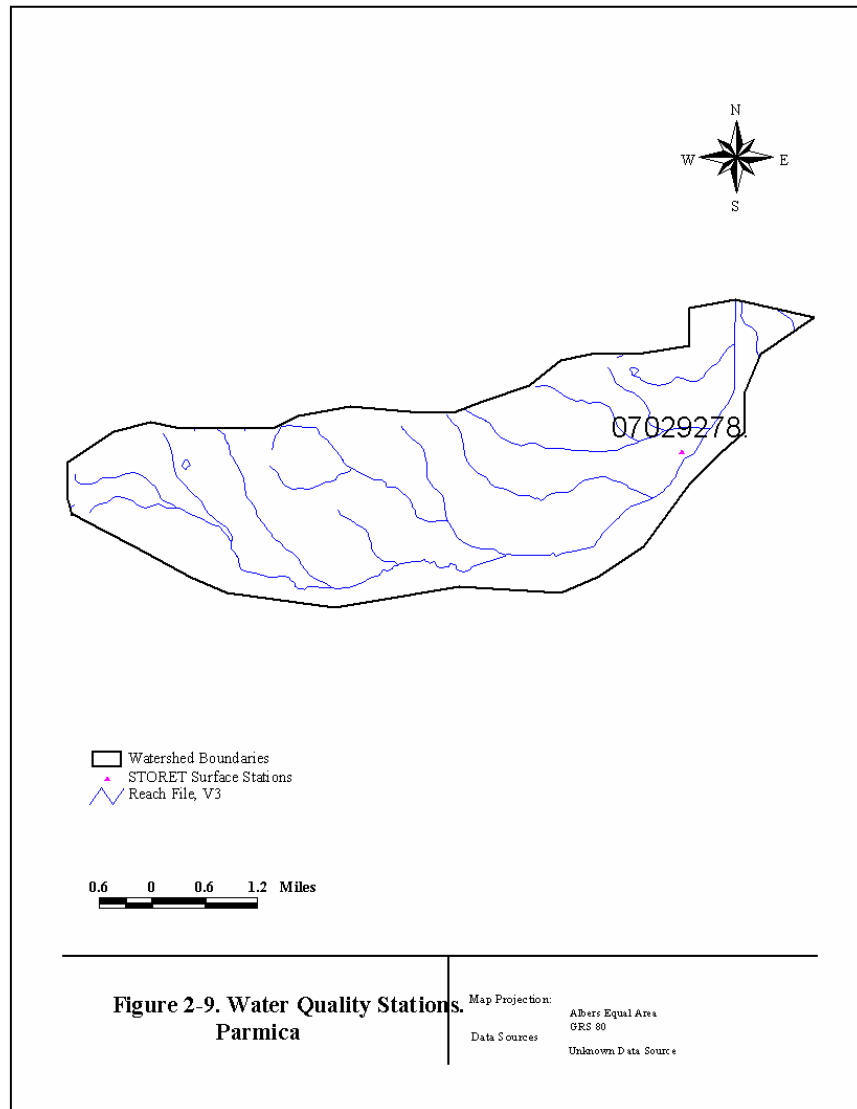


Figure 3: Monitoring Station Location

3.0 CONCLUSION

MDEQ has completed the field monitoring necessary to accurately assess this waterbody. Unfortunately, the results of the laboratory work will not be available until after the court ordered deadline for production of this TMDL. Therefore, MDEQ is proposing this Phase 1 TMDL to meet the terms of the consent decree and to allow for the necessary time needed to accurately assess the data that has already been collected.

In order to ensure no additional harm comes to the stream in the intervening 6-month period, no additional NPDES Permits will be approved for discharge into Parmicha Creek until the Phase 2 TMDL is completed or the waterbody is determined to not be impaired. In addition, MDEQ will not allow any increases in the NPDES permit already in place for Parmicha Creek. Modeling has shown that the current NPDES Permitted Facility does not impair the waterbody for CBOD₅.

Once the results from the current RBA are available in January 2002, MDEQ will evaluate the necessity of further investigation of the water quality in Parmicha Creek and a Phase 2 TMDL. If the current RBA results indicate that the water quality is not impaired, this moratorium on new dischargers for this creek will be removed.

3.1 Future Monitoring

Additional monitoring may be required to identify any specific pollutant causing biologic impairment in the stream. The necessity of obtaining that information will be a result of the analysis of the data that has already been collected. In addition, MDEQ has adopted the Basin Approach to Water Quality Management, a plan that divides Mississippi's major drainage basins into five groups. During each yearlong cycle, MDEQ resources for water quality monitoring will be focused on one of the basin groups. During the next monitoring phase in the North Independent Streams Basin, Parmicha Creek may receive additional monitoring to identify any change in water quality.

3.2 Public Participation

This TMDL will be published for a 30-day public notice. During this time, the public will be notified by publication in the statewide newspaper and a newspaper in Alcorn County. The public will be given an opportunity to review the TMDL and submit comments. At the end of the 30-day period, MDEQ will determine the level of interest in the TMDL and make a decision on the necessity of holding a public hearing.

If a public hearing is deemed appropriate, the public will be given a 30-day notice of the hearing to be held at a location near the watershed. That public hearing would be an official hearing of the Mississippi Commission on Environmental Quality, and would be transcribed.

All comments received during the public notice period and at any public hearings become a part of the record of this TMDL. All comments will be considered in the ultimate approval of this TMDL by the Commission on Environmental Quality and for submission of this TMDL to EPA Region 4 for final approval.

REFERENCES

MDEQ. 1994. *Wastewater Regulations for National Pollutant Discharge Elimination System (NPDES) Permits, Underground Injection Control (UIC) Permits, State Permits, Water Quality Based Effluent Limitations and Water Quality Certification*. Office of Pollution Control.

MDEQ. 1995. *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Costal Waters*. Office of Pollution Control.

MDEQ. 1998. *Mississippi List of Waterbodies, Pursuant to Section 303(d) of the Clean Water Act*. Office of Pollution Control.

MDEQ. 1998. *Mississippi 1998 Water Quality Assessment, Pursuant to Section 305(b) of the Clean Water Act*. Office of Pollution Control.

DEFINITIONS

Daily discharge: the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily average" is calculated as the average.

Designated Use: use specified in water quality standards for each waterbody or segment regardless of actual attainment.

Discharge Monitoring Report: report of effluent characteristics submitted by a NPDES Permitted facility.

Effluent standards and limitations: all State or Federal effluent standards and limitations on quantities, rates, and concentrations of chemical, physical, biological, and other constituents to which a waste or wastewater discharge may be subject under the Federal Act or the State law. This includes, but is not limited to, effluent limitations, standards of performance, toxic effluent standards and prohibitions, pretreatment standards, and schedules of compliance.

Effluent: treated wastewater flowing out of the treatment facilities.

Impaired Waterbody: any waterbody that does not attain water quality standards due to an individual pollutant, multiple pollutants, pollution, or an unknown cause of impairment.

Land Surface Runoff: water that flows into the receiving stream after application by rainfall or irrigation. It is a transport method for nonpoint source pollution from the land surface to the receiving stream.

Load allocation (LA): the portion of a receiving water's loading capacity attributed to or assigned to nonpoint sources (NPS) or background sources of a pollutant.

Loading: the total amount of pollutants entering a stream from one or multiple sources.

Nonpoint Source: pollution that is in runoff from the land. Rainfall and other water that does not evaporate become surface runoff and either drains into surface waters or soaks into the soil and finds its way into groundwater. This surface water may contain pollutants that come from land use activities such as agriculture; construction; silviculture; surface mining; disposal of wastewater; hydrologic modifications; and urban development.

NPDES permit: an individual or general permit issued by the Mississippi Environmental Quality Permit Board pursuant to regulations adopted by the Mississippi Commission on Environmental Quality under Mississippi Code Annotated (as amended) §§ 49-17-17 and 49-17-29 for discharges into State waters.

Point Source: pollution loads discharged at a specific location from pipes, outfalls, and conveyance channels from either wastewater treatment plants or industrial waste treatment facilities. Point sources can also include pollutant loads contributed by tributaries to the main receiving stream.

Pollution: contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the State, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance, or leak into any waters of the State, unless in compliance with a valid permit issued by the Permit Board.

Total Maximum Daily Load or TMDL: the calculated maximum permissible pollutant loading to a waterbody at which water quality standards can be maintained.

Waste: sewage, industrial wastes, oil field wastes, and all other liquid, gaseous, solid, radioactive, or other substances which may pollute or tend to pollute any waters of the State.

Wasteload allocation (WLA): the portion of a receiving water's loading capacity attributed to or assigned to point sources of a pollutant. It also contains a portion of the contribution from septic tanks

Water Quality Standards: the criteria and requirements set forth in *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*. Water quality standards are standards composed of designated present and future most beneficial uses (classification of waters), the numerical and narrative criteria applied to the specific water uses or classification, and the Mississippi antidegradation policy.

Water quality criteria: elements of State water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports the present and future most beneficial uses.

Waters of the State: all waters within the jurisdiction of this State, including all streams, lakes, ponds, wetlands, impounding reservoirs, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, situated wholly or partly within or bordering upon the State, and such coastal waters as are within the jurisdiction of the State, except lakes, ponds, or other surface waters which are wholly landlocked and privately owned, and which are not regulated under the Federal Clean Water Act (33 U.S.C.1251 et seq.).

Watershed: the area of land draining into a stream at a given location.

ABBREVIATIONS

BMP	Best Management Practice
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EPA.....	Environmental Protection Agency
GIS	Geographic Information System
HUC	Hydrologic Unit Code
IBI.....	Index of Biological Integrity
LA	Load Allocation
MARIS.....	State of Mississippi Automated Information System
MDEQ.....	Mississippi Department of Environmental Quality
MOS.....	Margin of Safety
NPDES.....	National Pollution Discharge Elimination System
RBA	Rapid Biological Assessment
WCS.....	Watershed Characterization System
WLA	Waste Load Allocation